CLAIMS

1. A carbon nanotube orientated composite in which carbon nanotubes are orientated in a matrix having a heat conductivity lower than that of the carbon nanotube in a given direction, and at least a part of the carbon nanotubes are contacted with each other to become continuous from one end to the other end between both ends in the orientated direction.

2. A carbon nanotube orientated composite according to claim 1, wherein a length of the carbon nanotube is 0.1-30 μm and a diameter thereof is 10-300 nm.

3. A carbon nanotube orientated composite according to claim 1 or 2, wherein the matrix is a metallic material.

4. A carbon nanotube orientated composite according to claim 3, wherein a compounding ratio of the metallic material and the carbon nanotube is 0.1-5 parts by mass of the carbon nanotube to 100 parts by mass of the metallic material.

5. A carbon nanotube orientated composite according to claim 3 or 4, wherein the metallic material is one or more of a metal selected from Al, Cu and Mg or an alloy containing the selected metal.

6. A carbon nanotube orientated composite according to any one of claims 3 to 5, wherein a heat conductivity of the carbon nanotube in the orientated direction is not less than 300 W/m · K.

7. A carbon nanotube orientated composite according to claim 1 or 2, wherein the matrix contains a rubber component.

8. A carbon nanotube orientated composite according to claim 7, wherein a compounding ratio of the rubber component and the carbon nanotube is 5-100 parts by mass based on 100 parts by mass of the rubber component.

9. A carbon nanotube orientated composite according to claim 7 or 8, wherein the rubber component is butyl rubber.

10. A carbon nanotube orientated composite according to any one of claims 7 to 9, wherein a heat conductivity of the carbon nanotube in the orientated direction is not less than 0.15 W/m · K.

11. A method of producing carbon nanotube orientated composite as claimed in any one of claims 3 to 6, which comprises fluidizing a melt dispersed carbon nanotubes into a molten metallic material and cooling and solidifying the melt on the way of the fluidization to orientate the carbon nanotubes.

12. A method of producing carbon nanotube orientated composite as claimed in any one of claims 7 to 10, which comprises milling a rubber component and carbon nanotubes, extruding the milled mass through an extruder and drawing the extruded mass at a drawing rate faster than an extrusion rate.

13. A pneumatic tire in which carbon nanotube orientated composites as claimed in any one of claims 7 to 10 are arranged in parallel to each other and covered with a coating rubber to form a heat releasing member, and the heat releasing member is arranged so that one end of the carbon nanotube orientated composite is exposed at an outer surface of the tire and the other end thereof is positioned in an interior of the tire.

14. A pneumatic tire according to claim 13, wherein the heat releasing member is arranged in the vicinity of at least one of an end of a belt and an turnup end of a carcass.

15. A pneumatic tire according to claim 13 or 14, wherein the heat releasing member has a thickness of 1-5 mm.

16. A wheel for a vehicle provided with a rim enclosing an interior portion of a tire in consort with the tire, in which the carbon nanotube orientated composite as claimed in any one of claims 3 to 6 is arranged so as to pass through the rim in its thickness direction, and an end of the carbon nanotube orientated composite is positioned in a portion contacting with the tire or a portion exposing to the interior portion of the tire and the other end thereof is positioned in a portion exposing to an atmosphere.

17. A wheel for a vehicle according to claim 16, wherein a high heat conductive member having a heat conductivity of not less than 300 W/m · K is coated onto a surface of the rim, and the high heat conductive member is extended from a first portion contacting with the.

tire or exposing to the interior portion of the tire to a second portion exposing to the atmosphere.

18. The invention is a wheel for a vehicle according to claim 17, wherein the high heat releasing member is an alloy of a metal selected from the group consisting of Al, Mg and Cu or a sintered body of the selected metal and a diamond.

19. A wheel for a vehicle according to claim 17 or 18, wherein a cooling means is arranged on an exposed surface of the second portion of the high heat conductive member.

20. A wheel for a vehicle according to claim 19, wherein a cooling fin is arranged on the surface as the cooling means.

21. A wheel for a vehicle according to any one of claims 16 to 20, wherein a heat collecting fin is arranged on a portion contacting with the interior of the tire.

22. A tire-wheel assembly comprising a wheel for a vehicle as claimed in any one of claims 16 to 21 and a tire mounted on the wheel for the vehicle and a gas inclusive of at least helium gas filled in an interior of the tire defined between the tire and the wheel.

23. A tire-wheel assembly comprising a wheel for a vehicle as claimed in any one of claims 16 to 22 and a tire mounted on the wheel for the vehicle and elastic balls filled in an interior of the tire defined between the wheel and the tire.

24. A disc brake comprising a rotor and a pad decelerating the rotor while sliding to the rotating rotor, in which a carbon nanotube orientated composite as claimed in any one of claims 3 to 6 is arranged on at least one part of the rotor and the pad, and an end of the carbon nanotube orientated composite is exposed to a sliding surface of the part or located in the vicinity of the sliding surface and the other end thereof is exposed to a surface other than the sliding surface of the part.

25. A disc brake according to claim 24, which further comprises a cooling means for cooling the surface of the part exposing the other end.

26. A disc brake according to claim 25, wherein the cooling means is a cooling fin disposed on the surface.